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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,067	02/11/2002	Tony Mule'	62004-1970	6679

24504 7590 08/06/2003

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EXAMINER

ARTMAN, THOMAS R

ART UNIT PAPER NUMBER

2882

DATE MAILED: 08/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/074,067

Applicant(s)

MULE' ET AL. *MC*

Examiner

Thomas R Artman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 10-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-9, drawn to an optical waveguide, classified in class 385, subclass 129.
- II. Claims 10-13, drawn to a method of manufacture, classified in class 438, subclass 31.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the apparatus can be made by a different process, such as forming the air gap by wafer bonding, thus leaving a gap between raised structures, rather than by etching a sacrificial layer.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

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Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Chris Linder, Reg.No. 47,751, on July 10th, 2003, a provisional election was made without traverse to prosecute the invention of the optical waveguide, claims 1-9. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-13 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3 and 6 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 6, 7 and 9 of copending Application No. 10/074420 in view of Horiguchi (US 3,950,073).

Regarding claims 1 and 6, the structural limitations of (1) a waveguide core and (2) an air-gap cladding are identical in both claims. The difference is that claim 2 of the conflicting application requires that the air-gap cladding is "around" a portion of the waveguide core, and claims 1 and 6 of the present invention requires that the cladding "engages" a portion of the waveguide core.

Horiguchi discloses an air-gap cladding (Fig.2, item 3) engaged with a waveguide core (item 1). Horiguchi teaches in cols.1 and 2, among other advantages, that an air-gap cladding engaged with a waveguide core of solid material allows much improved optical transmission with lower losses since the index of refraction difference between the core and cladding are much greater, as is well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an air-gap cladding layer engaged with a waveguide core for improved, low-loss signal transmission.

Regarding claim 2, the identical structure is disclosed in the conflicting application, including (1) a waveguide core (claim 1), (2) an air-gap cladding (claim 9), and (3) the waveguide core includes at least one coupling element (claim 7). The difference is that claim 9 of the conflicting application requires that the air-gap cladding is “around” a portion of the waveguide core, and claim 1 of the present invention requires that the cladding “engages” a portion of the waveguide core.

As stated above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an air-gap cladding layer engaged with a waveguide core for improved, low-loss signal transmission as taught by Horiguchi.

With respect to claim 3, the relationship claimed in conflicting application’s claim 6, “a coupling element adjacent to the waveguide core,” reads on the present application’s claim 3, anticipating “a coupling element disposed adjacent to the waveguide core.”

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Horiguchi (US 3,950,073).

Regarding claims 1 and 6, Horiguchi discloses an optical waveguide (Fig.1) that has:

- 1) a waveguide core (item 1), and
- 2) an air-gap cladding (item 3) engaging a portion of the waveguide core.

With respect to claim 4, Horiguchi discloses a second cladding layer (item 4 of Fig.2) disposed adjacent to the waveguide core.

With regards to claim 5, Horiguchi discloses, in Fig.4, a waveguide having a waveguide core (item 1-1) with an air-gap cladding that has a second waveguide core (item 1-2).

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Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Kimerling (US 2002/0076188).

Regarding claims 1 and 6, Kimerling discloses an optical waveguide (Figs.1,2A,2B and 5B), including:

- 1) a waveguide core (item 102), and
- 2) an air-gap cladding (item 104) engaging a portion of the waveguide core.

With respect to claim 2, Kimerling discloses a coupling element included in the waveguide core (section 2 of Fig.1).

With respect to claim 3, Kimerling discloses a coupling element disposed adjacent to the waveguide core (section 2 of Fig.1).

In regards to claim 4, Kimerling discloses a second waveguide cladding (cladding posts of Fig.5B) adjacent to the waveguide core.

With regards to claim 5, Kimerling discloses a second waveguide core (wider core beyond the taper regions in Fig.1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiguchi.

Regarding both claims, though coupling structures are not explicitly shown by Horiguchi, it would have been obvious to one of ordinary skill in the art at the time the invention was made that optical fibers are used with coupling devices in order to couple between other optical fibers or to optical transceivers, etc. Without coupling light into or out of the fiber, the waveguide would be useless.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiguchi and in view of Wojnarowski (US 5,737,458).

Horiguchi does not specifically disclose the inclusion of the waveguide with microelectronic, integrated optical or photonic crystal devices.

Wojnarowski shows an optical fiber coupled to such devices in Figs.2-8, item 58.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect a waveguide to such devices because they are used to generate/detect optical signals that propagate in the waveguide, such as laser diodes and photodetectors. This is standard in the art.

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Conclusion


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kragl, Schultz (US 6,285,813) and Gaylord et al. (IEEE) teach the use of solid-state gratings (including volumetric gratings) as optical couplers in integrated optical devices. Kragl continues by stating the usefulness of the air cladding layer for easy coupling between waveguides using a grating. Ramdani (US 6,493,497) discloses an air cladding layer with optoelectronic devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (703) 305-0203. The examiner can normally be reached on 8am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (703) 308-4858. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Thomas R. Artman
Patent Examiner
July 24, 2003



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